SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-45

Name: Sorum Lake **County:** Perkins

Legal description: T 17N, R 10E, Sec. 16
Location from nearest town: 1 miles east and 1 mile south of Sorum, SD
Dates of present survey: July 9-10, 2012
Date last surveyed: July 11-13, September 27, 2011
Management classification: Warmwater permanent

Primary Species (game and forage):	Secondary and other species:
1. Largemouth Bass	1. Black Bullhead
2. Walleye	2. Green Sunfish
3. Yellow Perch	3. Golden Shiner
4. Black Crappie	4.

PHYSICAL CHARACTERISTICS

Surface Area: 88 acres; **Watershed:** 54,000 acres
Maximum depth: 17 feet; **Mean depth:** 5.5 feet
Lake elevation at survey (from known benchmark): Three feet below full-pool

Ownership of lake and adjacent lakeshore property

Sorum Lake is a state owned dam and the South Dakota Department of Game, Fish and Parks (SDGFP) manages the fishery. The terrestrial area around the lake and dam is managed as a Game Production Area (GPA).

Fishing Access

Fishing access is poor at Sorum Lake as the boat ramp is steep and degraded. Large amounts of vegetation make shore fishing extremely difficult from late spring through the fall.

Observations of Water Quality and Aquatic vegetation

Rooted aquatic vegetation consists of bulrushes and cattails. The vegetation covers approximately 75% of the shoreline. Submerged vegetation is excessive from mid summer until freeze up in water depths under 5 feet.

Observations on conditions of structures (i.e. spillway, boat ramps and docks, roads, etc)

The dam is seeping and the boat ramp is in poor condition and is unusable in low water conditions.

MANAGEMENT OBJECTIVES

Objective 1. Maintain Largemouth bass PSD between 20 and 40 and Walleye PSD between 30 and 60.

Objective 2. Maintain Yellow Perch, Black Crappie and Black Bullhead PSD's greater than 30 and Black Bullhead trap net CPUE below 100

BIOLOGICAL DATA

The fishery survey was conducted at Sorum Lake on July 9-10, 2012. Sampling consisted of two experimental gill (gill) net (45.7 m [150 ft] long and 1.8 m [6 ft] deep with six 7.6 m [25 ft] panels of bar mesh sizes: 12.7 mm [0.5 in], 19.1 mm [0.75 in], mm [1.25 in], 38.1 mm [1.5 in], and 50.8 mm [2.0 in]) and five modified fyke (trap) net nights consisting of a 1.3 X 1.5 m frame, 19.1 mm (0.75 in) mesh and a 1.2 X 23 m (3.9 X 75.5 ft) lead (Figure 1). Six species were collected in trap nets, while three species were collected in gill nets (Tables 1 and 2). No fall nighttime boat electrofishing was conducted in 2012 due to low water levels.

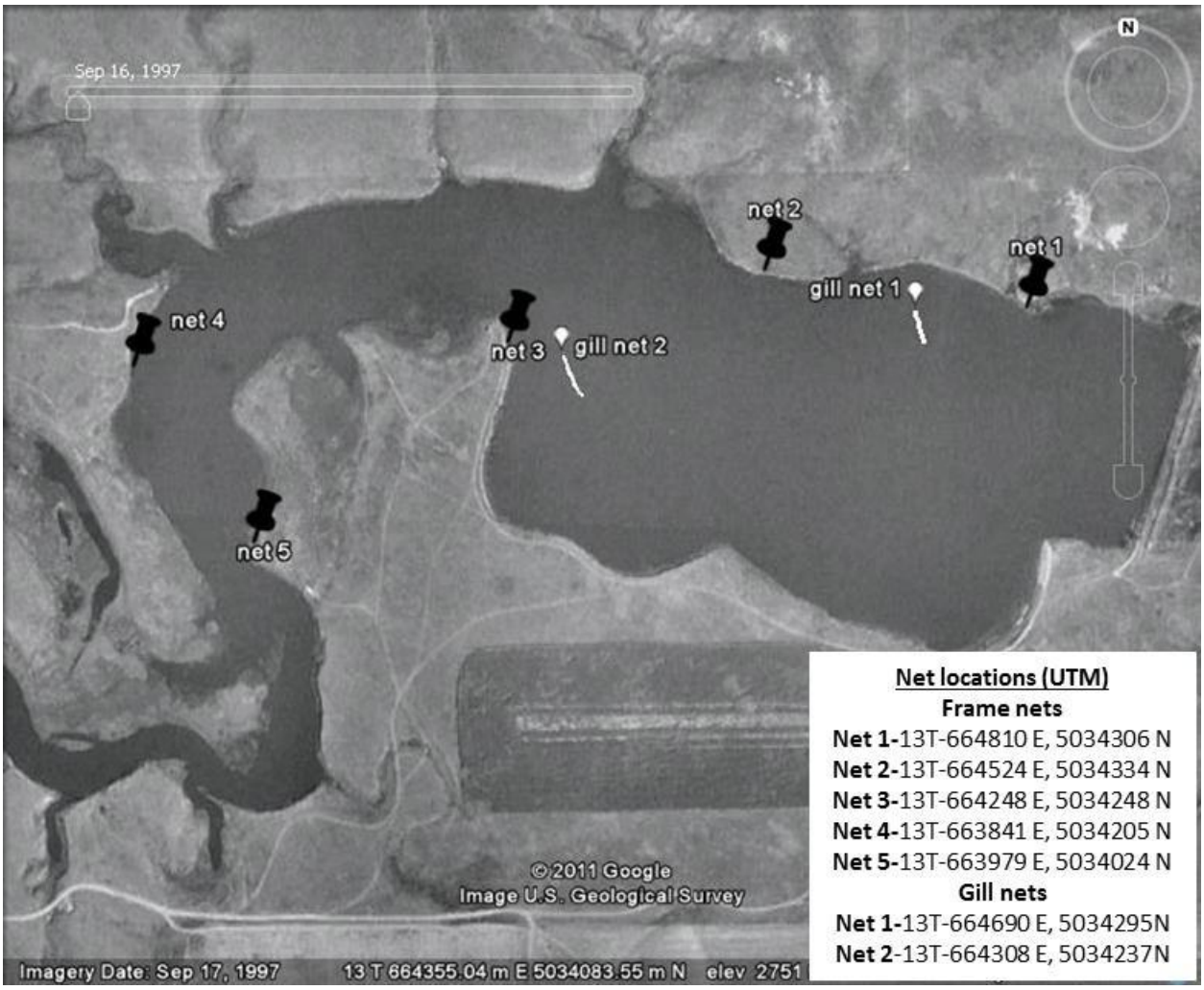

Figure 1. Locations of modified fyke (frame) and experimental gill (gill) nets used during the fisheries survey of Sorum Lake, Perkins, County, 2012.

Table 1. Species, number captured (N), catch per unit effort (CPUE and CPUE-S), proportional stock densities (PSD and PSD-P) and relative weight of stock length or greater fish (*Wr*>S) from all species collected in modified fyke trap nets in Sorum Lake, Perkins County, South Dakota, 2012. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr*>S with 90% confidence intervals in parentheses

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* ≥ S
Black Bullhead	107	21.4 (32.8)	21.4 (32.8)	9 (5)	0	85.4 (1.8)
Black Crappie	93	18.6 (12.9)	18.4 (12.7)	65 (8)	0	104.9 (0.7)
Green Sunfish	63	12.6 (16.8)	12.6 (16.8)	81 (8)	0	97.1 (3.4)
Largemouth Bass	6	1.2 (0.8)	1.2 (0.8)	100	0	105.1 (7.6)
Walleye	27	5.4 (7.3)	5.4 (7.3)	37 (16)	0	82.1 (0.6)
Yellow Perch	110	22.0 (15.7)	22.0 (15.7)	62 (8)	0	88.8 (1.0)
Total	406					

Table 2. Species, number captured (N), catch per unit effort (CPUE and CPUE-S), proportional stock densities (PSD and PSD-P) and relative weight of stock length and greater fish (*Wr*>S) from all species collected in experimental gill nets in Sorum Lake, Perkins County, July 9-10, 2012. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr*>S with 90% confidence intervals in parentheses

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* ≥ S
Black bullhead	79	39.5 (20.0)	39.5 (20.0)	1 (2)	0	106.1 (1.0)
Walleye	4	2.0 (6.2)	2.0 (6.2)	--	--	82.6 (4.7)
Yellow perch	242	121.0 (123.1)	121.0 (123.1)	28 (5)	0	95.5 (1.2)
Total	325					

Black Bullhead

The origins of the Black Bullhead population within Sorum Lake is unknown as they were not introduced by SDGFP. Trap net catch per unit effort (CPUE) was 21.4 and gill net CPUE was 39.5 (Tables 1 and 2). These numbers are much lower than last year when CPUE was 209.8 and 190.0, respectively. Numbers of quality length fish remain low with a proportional stock density (PSD) of 9, compared to 5 in 2011. Condition of adult fish was low from the trap net sample, with a mean relative weight for stock length and longer fish *Wr* ≥ S at 85.4. As predator populations increase, Black Bullhead numbers should decrease and size structure should increase. The length frequency histogram shows the large year class in the 170 to 240 mm range (Figure 2).

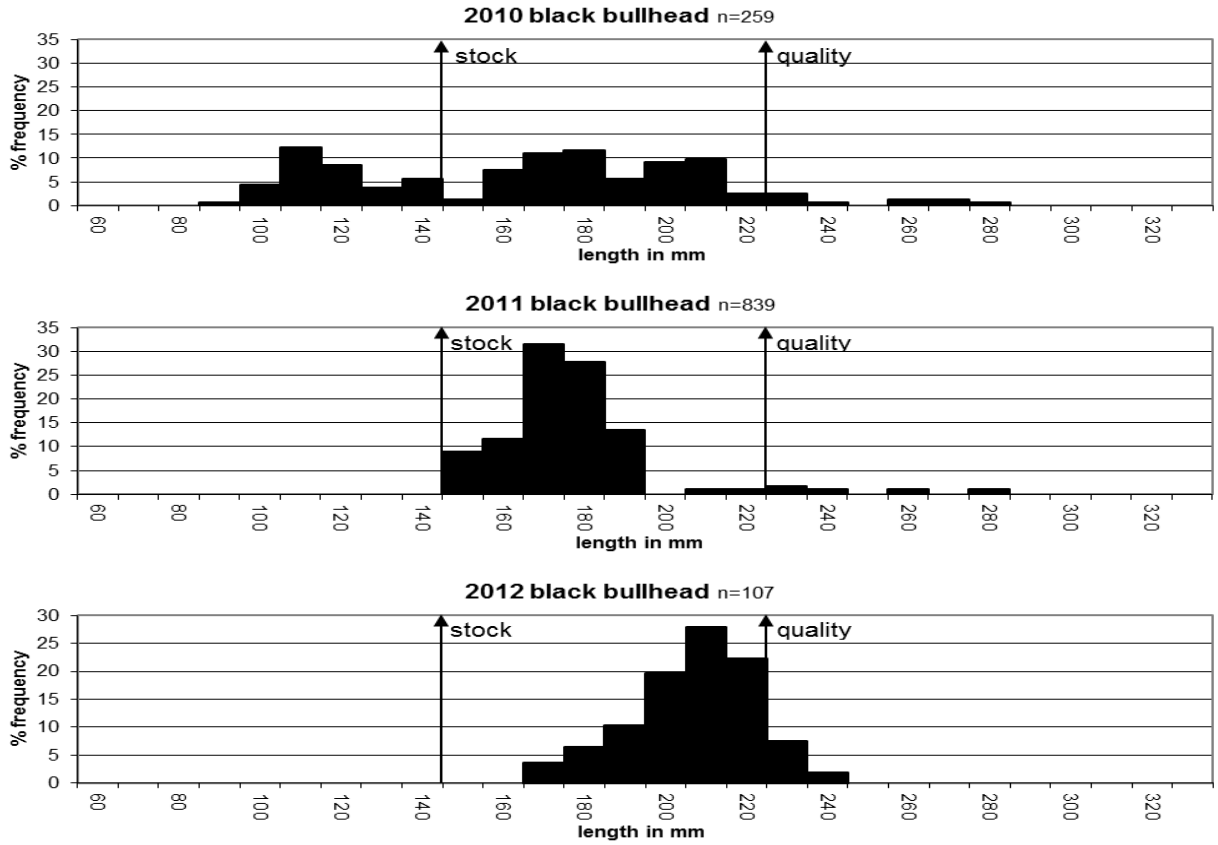

Figure 2. Length frequency histograms for Black Bullheads collected in modified fyke nets in Sorum Lake, Perkins County, South Dakota 2010-2012.

Green Sunfish

Similar to the Black Bullhead population, the origins of the Green Sunfish population in Sorum Lake is unknown. In 2012, trap net CPUE of 12.6. This number is down from 2011's CPUE of 83.8. Size structure of the population continues to increase, with a PSD of 83 compared to 34 in 2011 (Table 1, Figure 3).

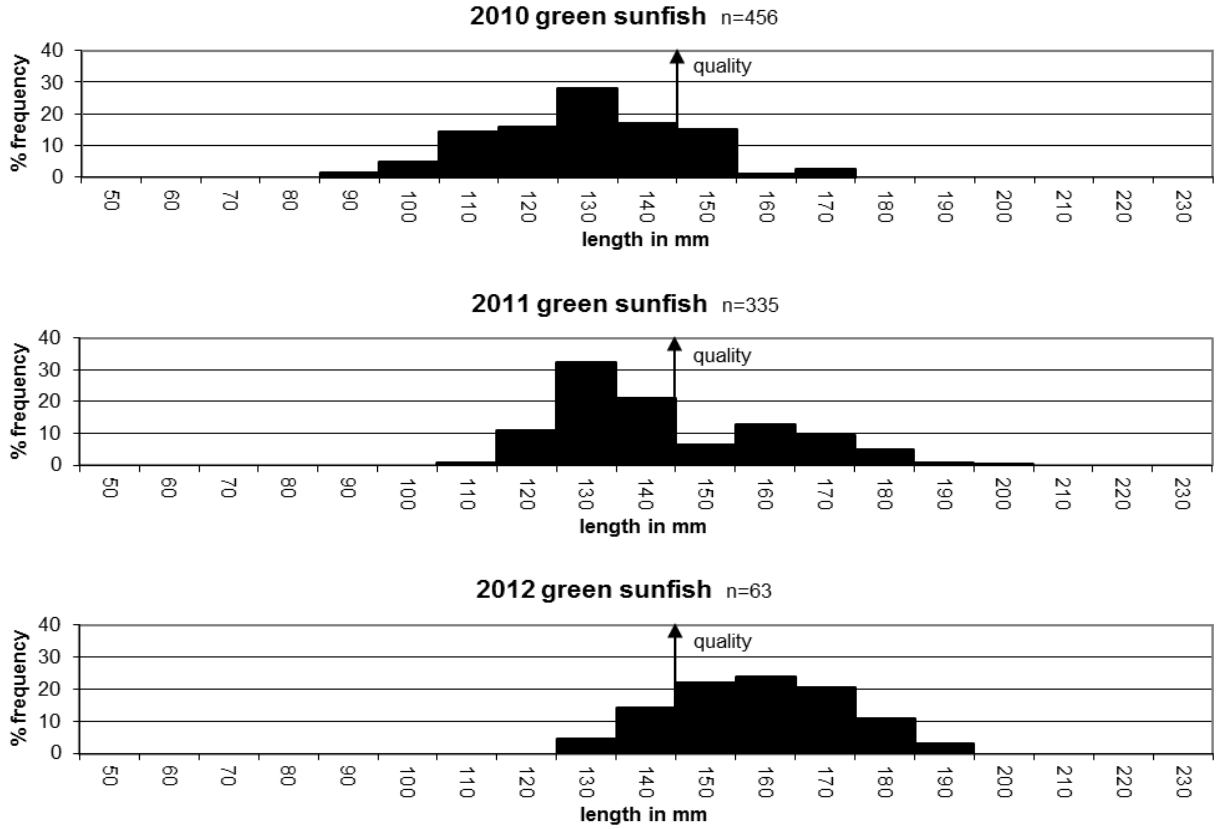

Figure 3. Length frequency histograms for Green Sunfish collected in modified fyke nets in Sorum Lake, Perkins County, South Dakota, 2010-2012.

Walleye

In 2012, CPUE was 2.0 and 5.4, respectively (Tables 1 and 2) compared to a gill net CPUE was 3.0 and trap net CPUE was 1.5 in 2011. The length frequency histogram shows excellent growth with a portion of the age-3 fish surpassing a length of 18 inches (Figure 4). Fish condition was average for the area with a mean *Wr* ≥ S of 82.

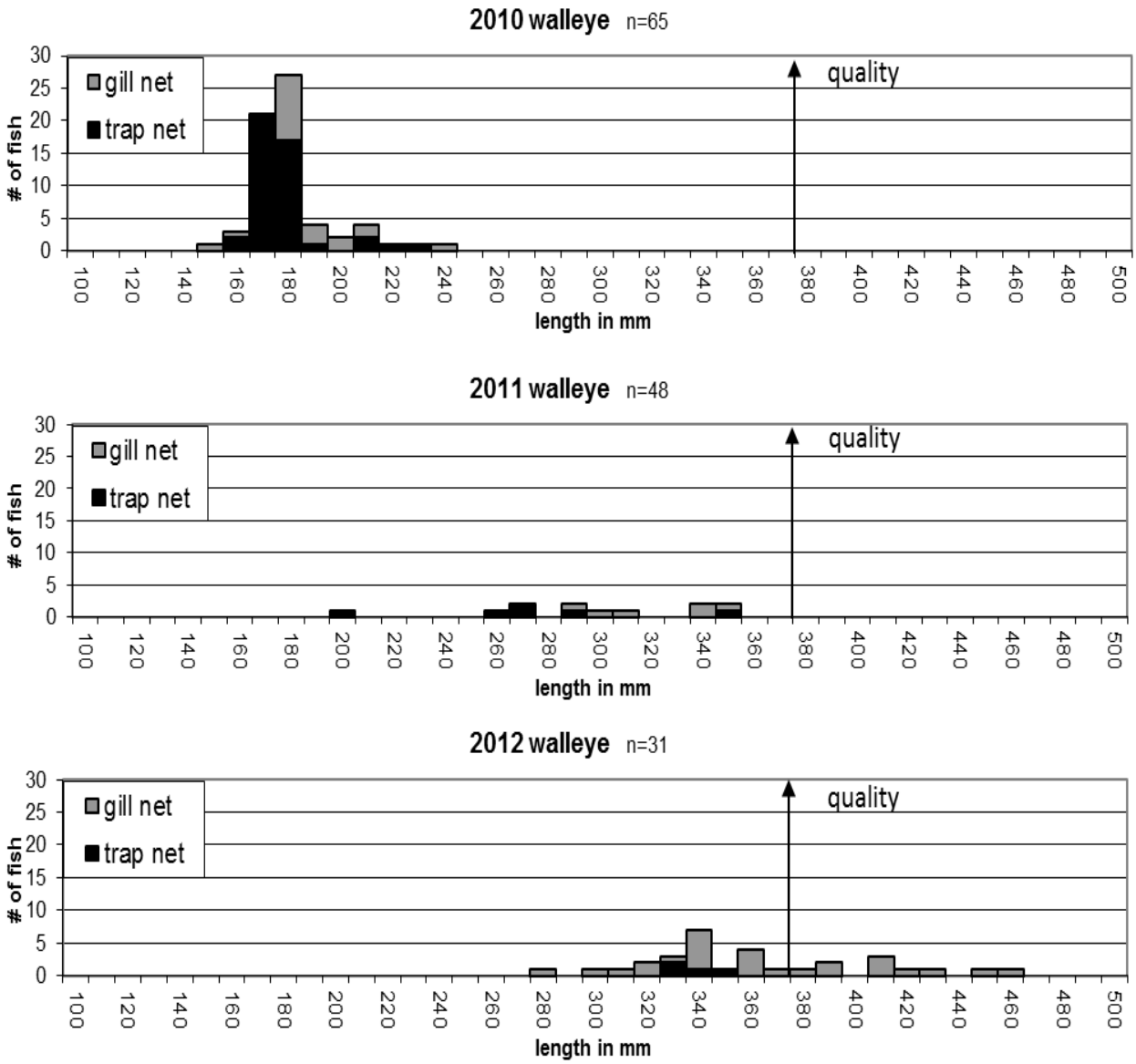

Figure 4. Length frequency histograms for Walleye collected in experimental gill (gill) and modified fyke (trap) nets in Sorum Lake, Perkins County, South Dakota, 2010-2012.

Yellow Perch

In 2012, gill net CPUE was 121.0 and trap net was CPUE of 22.0 (Tables 1 and 2), compared to a CPUE was 44.5 and 250.0 in 2011, respectively. Yellow Perch size structure appears to have remained stable from 2011 (Figure 5). As a good portion of the population over eight inches Sorum Lake should provide an excellent fishery this winter. Fish condition was good with a *Wr* ≥ S between 89 and 96, depending on gear type.

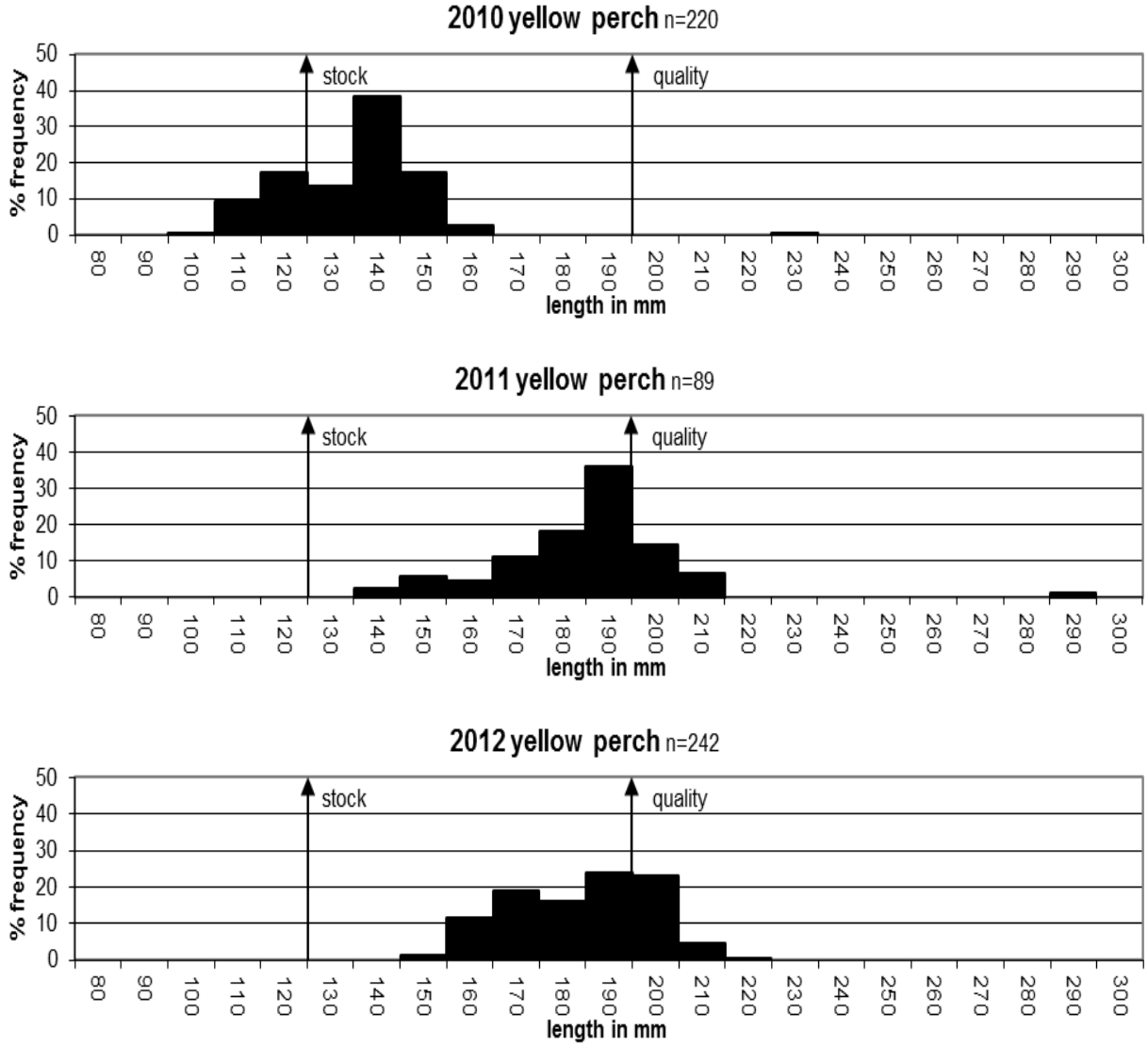

Figure 5. Length frequency histograms for Yellow Perch collected in experimental gill nets in Sorum Lake, Perkins County, 2010-2012.

RECOMMENDATIONS

1. Continue conducting electrofishing surveys, when water levels warrant, annually to monitor the Largemouth Bass and Walleye populations.

2. Continue conducting netting surveys annually or biennially to monitor fish populations.

3. Stock Largemouth Bass and Walleye when available to increase predator numbers in hopes of keeping Yellow Perch, Green Sunfish and Black Bullhead numbers within objective levels.

APPENDIX

Appendix A. Stocking history, including year, number stocked, species and size of fish stocked into Sorum lake, Perkins County, South Dakota, 2009-2012.

Year	Number	Species	Size
2009	550	Yellow Perch	Adult
	200	Black Crappie	Adult
	43,800	Walleye	Fingerling
	7,320	Largemouth Bass	Fingerling
2010	490	Yellow Perch	Adult
	250	Golden Shiner	Adult
	9,000	Walleye	Fingerling
2012	240	Largemouth Bass	Adult
	20,150	Largemouth Bass	Fingerling